APPLICATION

FOR

UNITED STATES LETTERS PATENT

TITLE: PROVIDING A USER INPUT INTERFACE PRIOR
         TO INITIATION OF AN OPERATING SYSTEM

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Express Mail No.   EL911617575US

Date: December 12, 2001

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Background

This invention relates generally to processor-based

5   systems and particularly to techniques for providing user

inputs in those systems.

A number of processor-based systems, such as web

tablets, include no keyboard. For example, many devices

use a touch screen, a mouse, or pen as the input device,

10   avoiding the need for a keyboard that takes up more space.

However each of these input devices generally needs an

operating system in order to receive user inputs.

In some cases, the inability to provide inputs prior

to booting of the operating system may create a problem.

15   For example, it may be desirable to require the user to

enter a password before actually booting the operating

system. Once the operating system is booted, the user may

be more able to hack the system in order to gain access

without a password. Thus it may be advantageous to require

20   entry of a password or other identifier before booting the

system.

As another example, it may be desirable for the user

to provide certain information to the system, such as

hardware settings, prior to actually booting the system.

25   In other words it may be desirable to enable the input of

setting information without requiring that the operating system be booted. Examples of machine setup information may be to convert the system from a universal serial bus (USB) to a PS-2 system, to provide different graphics, or to provide a different hard drive.

Of course in systems without a keyboard, there is no way to provide information prior to the time the operating system has booted. Before operating system boot or in the pre-boot phase, the input devices are incapacitated since they require a functioning operating system.

Therefore, there is a need for a way to receive inputs in processor-based systems in the pre-boot phase.

Brief Description of the Drawings

Fig. 1 is a front plan view of one embodiment of the present invention;

Fig. 2 is a block depiction of the embodiment shown in Fig. 1 in accordance with one embodiment of the present invention; and

Fig. 3 is a flow chart for software in accordance with one embodiment of the present invention.

Detailed Description

Referring to Fig. 1, a processor-based system 10 may include a housing 66 and a display 16. In one embodiment, the display 16 may be a liquid crystal display and the processor-based system 10 may be battery powered. The

system 10 may include no keyboard. Instead, the system 10
may use input devices such as a touch screen, a pen, or a
mouse. Textual inputs may be entered prior to booting an
operating system using an on-screen keyboard image included

5   in a graphical user interface 68.

Examples of systems 10 include personal digital
assistants, appliances such as cameras, and web tablets.
These devices may be more portable and relatively lower in
weight by eliminating the keyboard.

10   Referring to Fig. 1, when the user operates a start
button 14, the graphical user interface 68 appears
including a prompt to enter a password and an on-screen
keyboard. This may be done before the operating system has
been booted. Instead, the interface 68 may be retrieved

15   from storage and displayed by opening a window.

When the user enters an appropriate password, as
determined by boot code running in a graphics controller,
booting of the operating system may be initiated in one
embodiment. In other embodiments, entry of machine

20   settings or other identifiers may be provided in the pre-
boot stage.

Turning to Fig. 2, the system 10 may include a
processor 42 coupled through an interface 44 to a graphics
controller 22. The main memory 46 may be coupled to the

25   interface 44 as may be a bus 18. The graphics controller
42 may receive inputs from a user input device 14 such as a

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mouse, a pen, or a touch screen display. Media control inputs 22 may be received by an image overlay generator 30. The image overlay generator 30 actually generates the interface 68. An interface 36 provides an interface

5   between the generator 30 and the user interface 14.

A host bus interface 24 may be coupled through the interface 44 to the processor 42 and the main memory 46. A memory control interface 26 may couple the interface 24 to an option memory 20 such as an option read only memory

10   (ROM). In addition, a digital signal processor (DSP) 32 and a graphic image storage 34 may be provided. The graphic image storage 34 stores an image that may be provided from the option memory 20 to generate the interface 68 and eventually displays the interface 68 on a

15   display 16. Thus the graphic interface storage 34 may be a frame buffer or other memory that is capable of storing an image for display on the display 16. A 3-D graphics coprocessor 28 may be utilized for 3-D interpolation applications. A clock synthesizer 38 and a power

20   management controller 40 may be provided as well.

The set up software 50 may be stored in the option memory 20, in one embodiment, for actually initiating the generation of an interface 68 during the pre-boot stage. Thus, the set up software 50 may be run from the graphics

25   controller loaded with code from an option memory or any other software operable during the pre-boot stage.

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Referring to Fig. 3, when user activity is detected, as indicated in block 52, the interface 68 is generated as indicated in block 54. The user activity may be operation of the button 14 indicating that the user wishes to initiate the system. Once the interface 68 is generated, the user inputs, such as a password, may be received through the interface 68 as indicated in block 56. The password entry may be part of the boot code stored in an option memory 20 as indicated in block 58. The entry may then be compared to a stored password necessary to gain access to the system 10 as indicated in block 60. If the graphics controller boot code determines that there is a password match in diamond 62, the boot operation may be started as indicated in block 64 in accordance with one embodiment of the present invention.

Thus, in some embodiments, even in systems without a keyboard, a graphical user interface 68 may be generated prior to booting of the system and this interface 68 may receive user inputs, for example to authenticate the user and to enable booting to occur. This may result in a more secure system than a system in which booting precedes user authentication. In other embodiments, machine settings or other identifiers may be advantageously received in the pre-boot stage before the available user input devices are operable. In some embodiments no operative hard disk or floppy drive is needed to start to use the system.

While the present invention has been described with respect to a limited number of embodiments, those skilled in the art will appreciate numerous modifications and variations therefrom. It is intended that the appended

5   claims cover all such modifications and variations as fall within the true spirit and scope of this present invention.